AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application. Amendments to the claims are shown below as well as new claims 26-29:

Claim 1 (Previously presented) A multi-joint coordinate measuring system comprising:

a support member;

a multi-joint measuring arm having a first end for installation of a probe and a second end for attachment to the support member, the arm including:

a head member for holding the probe;

a first link;

a second link;

a wrist joint for providing a bending motion between the head member and the first link;

an elbow joint for providing a bending motion between the first link and the second link; and

a shoulder joint for providing a bending motion between the second link and the support member;

a processor configured to produce a three-dimensional coordinate corresponding to a position of the probe based on an angle of each joint of the measuring arm; and

a warning indicator that warns a user in response to a determination of an angle between the first and second links, a determination of a distance from a supporting point of the measuring arm to a head point of the measuring arm, and a detection of at least

one of first and second conditions, the first condition being that the determined angle between the first and second links exceeds a first value and the second condition being that the determined distance from the supporting point of the measuring arm to the head point of the measuring arm exceeds a second value.

Claim 2 (Original) The system according to claim 1, wherein

the processor is further operative to detect the first condition based on an angle of the elbow joint.

Claim 3 (Original) The system according to claim 1, wherein

the processor is further operative to detect the second condition using, as the supporting point of the measuring arm, a point determined based on at least one of a position of the shoulder joint, a position of the second end, and a position of the support member.

Claim 4 (Original) The system according to claim 1, wherein

the processor is further operative to detect the second condition using, as the head point of the measuring arm, a point determined based on at least one of a position of the wrist joint, a position of the head member, and the position of the probe.

Claim 5 (Original) The system according to claim 1, wherein

the processor is further operative to detect the second condition by determining a position of the wrist, calculating a distance between the determined position and the supporting point, and comparing the calculated distance with the second value.

Claim 6 (Original) The system according to claim 1, further comprising

a counter balance, provided in association with the shoulder joint, for generating a force raising the second link on a side of the elbow joint against gravity,

and wherein

the warning indicator warns a user in response to a detection of at least one of the first and second conditions and a third condition, the third condition being that the shoulder joint provides the second link with a bending motion beyond a range determined based on the force generated by the counter balance.

Claim 7 (Original) The system according to claim 1, further comprising

a counter balance, provided in association with the shoulder joint, for generating a force raising the second link on a side of the elbow joint against gravity,

and wherein

the processor uses, to produce the three-dimensional coordinate, a formula including a term for correcting an error due to a change of the force generated by the counter balance, the force varying depending on an angle of the shoulder joint.

Claim 8 (Original) The system according to claim 1, wherein

the processor is controlled not to output the three-dimensional coordinate after the detection.

Claim 9 (Original) The system according to claim 1, wherein

the measuring arm further includes:

a first joint for providing a twisting motion between the head member and the first link;

a second joint for providing a twisting motion between the first link and the second link; and

a third joint for providing a twisting motion between the second link and the support member.

Claim 10 (Original) A multi-joint coordinate measuring system comprising:

a support member;

a multi-joint measuring arm having a first end for installation of a probe and a second end for attachment to the support member, the arm including:

a head member for holding the probe;

a first link;

a second link;

a wrist joint for providing a bending motion between the head member and the first link;

an elbow joint for providing a bending motion between the first link and the second link; and

a shoulder joint for providing a bending motion between the second link and the support member;

a processor configured to produce a three-dimensional coordinate corresponding to a position of the probe based on an angle of each joint of the measuring arm;

a counter balance, provided in association with the shoulder joint, for generating a force raising the second link on a side of the elbow joint against gravity; and

a warning indicator that warns a user in response to a detection of a condition that the shoulder joint provides the second link with a bending motion beyond a range determined based on the force generated by the counter balance.

Claim 11 (Original) The system according to claim 10, wherein

the processor is controlled not to output the three-dimensional coordinate after the detection.

Claim 12 (Original) The system according to claim 10, wherein

the measuring arm further includes:

a first joint for providing a twisting motion between the head member and the first link;

a second joint for providing a twisting motion between the first link and the second link; and

a third joint for providing a twisting motion between the second link and the support member.

Claim 13 (Currently amended) A method of controlling measurement by a multi-joint coordinate measuring system, the system including a support member, a multi-joint measuring arm having a first end attached to the support member and a second end, a probe installed at the second end of the measuring arm, and a processor capable of producing a three-dimensional coordinate corresponding to a position of the probe based on an angle of each joint of the measuring arm, the method comprising:

storing a prescribed value concerning a posture of the measuring arm, the prescribed value having been determined such that a measurement error due to a user action pulling the measuring arm away from the support member would become within an allowable range;

determining a parameter concerning the posture of the measuring arm;

detecting [a] the determined parameter ~~concerning a posture of the measuring arm~~ exceeding [a] the stored prescribed value~~, the prescribed value having been determined in accordance with a first probability that a measurement error due to a user action pulling the measuring arm away from the support member becomes out of an allowable range~~; and

warning a user in accordance with a result of the detecting.

Claim 14 (Original) The method of claim 13, wherein

a first parameter concerning an angle between links of the measuring arm and a second parameter concerning a distance of the measuring arm's reach are used in the detecting, and

the warning is performed when at least one of the first and second parameters exceeds a corresponding prescribed value.

Claim 15 (Original) The method of claim 13, further comprising

controlling the processor not to output the three-dimensional coordinate in accordance with a result of the detecting.

Claim 16 (Currently amended) The method of claim 13, further comprising:

additionally detecting the parameter concerning the posture of the measuring arm exceeding a limit value, the limit value ~~corresponding to a second probability concerning the measurement error~~ being larger than the prescribed value ~~first probability~~; and

controlling the processor not to output the three-dimensional coordinate in accordance with a result of the additional detecting.

Claim 17 (Currently amended) A method of controlling measurement by a multi-joint coordinate measuring system, the system including a support member, a multi-joint measuring arm having a first end attached to the support member and a second end, a probe installed at the second end of the measuring arm, a processor capable of producing a three-dimensional coordinate corresponding to a position of the probe based on an angle of each joint of the measuring arm, and a counter balance configured to generate a force raising the measuring arm against gravity, the method comprising:

storing a prescribed value concerning a posture of the measuring arm, the prescribed value having been determined such that a measurement error due to a user action moving the measuring arm with a change in the force applied to the measuring arm by the counter balance would become within an allowable range;

determining a parameter concerning the posture of the measuring arm;

detecting [a] the determined parameter ~~concerning a posture of the measuring arm~~ exceeding [a] the stored prescribed value~~, the prescribed value having been determined in accordance with a first probability that a measurement error due to a user action moving the measuring arm with a change in the force applied to the measuring arm by the counter balance becomes out of an allowable range~~; and

warning a user in accordance with a result of the detecting.

Claim 18 (Original) The method of claim 17, further comprising

controlling the processor not to output the three-dimensional coordinate in accordance with a result of the detecting.

Claim 19 (Currently amended) The method of claim 17, further comprising:

additionally detecting the parameter concerning the posture of the measuring arm exceeding a limit value, the limit value ~~corresponding to a second probability concerning the measurement error~~ being larger than the prescribed value ~~first probability~~; and

controlling the processor not to output the three-dimensional coordinate in accordance with a result of the additional detecting.

Claim 20 (Original) A multi-joint coordinate measuring system comprising:

a support member;

a multi-joint measuring arm having a first end for installation of a probe and a second end for attachment to the support member, the arm including:

a head member for holding the probe;

a first link;

a second link;

a wrist joint for providing a bending motion between the head member and the first link;

an elbow joint for providing a bending motion between the first link and the second link; and

a shoulder joint for providing a bending motion between the second link and the support member;

a counter balance, provided in association with the shoulder joint, for generating a force raising the second link on a side of the elbow joint against gravity; and

a processor configured to input an angle of each joint of the measuring arm into a formula to produce a three-dimensional coordinate corresponding to a position of the probe, the formula including a term for correcting an error due to a change of the force generated by the counter balance.

Claim 21 (Original) The system according to claim 20, wherein

the formula includes, in association with the term, a parameter representing a deflection of the second link due to the force generated by the counter balance, the parameter being determined based on an angle of the shoulder joint.

Claim 22 (Original) The system according to claim 20, wherein

the measuring arm further includes:

a first joint for providing a twisting motion between the head member and the first link;

a second joint for providing a twisting motion between the first link and the second link; and

a third joint for providing a twisting motion between the second link and the support member.

Claim 23 (Original) A method of measuring a three-dimensional coordinate by a multi-joint coordinate measuring system, the system including a support member, a multi-joint measuring arm having a first end attached to the support member and a second end, a probe installed at the second end of the measuring arm, and a counter balance configured to generate a force raising the measuring arm against gravity, the method comprising:

inputting a plurality of joint angle data from the measuring arm;

calculating from the input data a three-dimensional coordinate corresponding to a position of the probe, by a formula including a term for correcting an error due to a change of the force generated by the counter balance; and

outputting the three-dimensional coordinate.

Claim 24 (Currently amended) A multi-joint coordinate measuring system comprising:

a support member;

a multi-joint measuring arm having a first end attached to the support member, a second end at which a probe can be installed, and a plurality of joints;

a memory that outputs a prescribed value concerning a posture of the measuring arm, the prescribed value having been determined such that a measurement error due to a user action pulling the measuring arm away from the support member would become within an allowable range;

a processor configured to produce a three-dimensional coordinate corresponding to a position of the probe based on an angle of each joint of the measuring arm, to determine a parameter concerning the posture of the measuring arm, and to detect [a] the determined parameter ~~concerning a posture of the measuring arm~~ exceeding [a] the prescribed value of the memory~~, the prescribed value having been determined in accordance with a probability that a measurement error due to a user action pulling the measuring arm away from the support member becomes out of an allowable range~~; and

a warning indicator configured to warn a user in accordance with a result of the detection by the processor.

Claim 25 (Currently amended) A multi-joint coordinate measuring system comprising:

a support member;

a multi-joint measuring arm having a first end attached to the support member, a second end at which a probe can be installed, and a plurality of joints;

a counter balance configured to generate a force raising the measuring arm against gravity;

a memory that outputs a prescribed value concerning a posture of the measuring arm, the prescribed value having been determined such that a measurement error due to a user action moving the measuring arm with a change in the force applied to the measuring arm by the counter balance would become within an allowable range;

a processor configured to produce a three-dimensional coordinate corresponding to a position of the probe based on an angle of each joint of the measuring arm, to determine a parameter concerning the posture of the measuring arm, and to detect [a] the determined parameter ~~concerning a posture of the measuring arm~~ exceeding [a] the prescribed value of the memory~~, the prescribed value having been determined in accordance with a probability that a measurement error due to a user action moving the measuring arm with a change in the force applied to the measuring arm by the counter balance becomes out of an allowable range~~; and

a warning indicator configured to warn a user in accordance with a result of the detection by the processor.

Claim 26 (Previously presented) The method of claim 13, wherein

the parameter concerning the posture of the measuring arm includes a parameter concerning an angle between links of the measuring arm.

Claim 27 (Previously presented) The method of claim 13, wherein

the parameter concerning the posture of the measuring arm includes a parameter concerning a distance of the measuring arm's reach.

Claim 28 (Currently amended) A multi-joint coordinate measuring system comprising:

a support member;

a multi-joint measuring arm having a first end attached to the support member, a second end at which a probe can be installed, and a plurality of joints;

a processor configured to produce a three-dimensional coordinate corresponding to a position of the probe based on an angle of each joint of the measuring arm; and

a warning indicator that warns a user in response to a determination of a distance of the measuring arm's reach and a detection of a condition that the determined distance ~~a parameter concerning a distance of the measuring arm's reach~~ exceeds a prescribed value.

Claim 29 (Previously presented) The method of claim 17, wherein

the parameter concerning the posture of the measuring arm includes a parameter concerning an angle of a joint of the measuring arm.